

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

REDWOOD TECHNOLOGIES, LLC,	§	
Plaintiff,	§	
v.	§	JURY TRIAL DEMANDED
TEXAS INSTRUMENTS INCORPORATED,	§	C.A. NO. 2:23-cv-136
Defendant.	§	
	§	

PLAINTIFF'S COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Redwood Technologies, LLC (“Redwood”) files this Complaint against Defendant Texas Instruments Incorporated (“TI” or “Defendant”) for infringement of U.S. Patent No. 7,460,485 (the ““485 patent”), U.S. Patent No. 7,664,130 (the ““130 patent”), U.S. Patent No. 7,917,102 (the ““102 patent”), and U.S. Patent No. 7,983,140 (the ““140 patent”), collectively, the “Asserted Patents.”

THE PARTIES

1. Redwood Technologies, LLC is a Texas limited liability company, with a principal place of business at 812 West McDermott Dr. #1038, Allen, TX 75013.

2. On information and belief, Texas Instruments Incorporated is a corporation organized and existing under the laws of Delaware, having a principal place of business at 12500 TI Boulevard, Dallas, Texas 75243. On information and belief, TI has business locations in this Judicial District at 6412 U.S. Highway 75, Sherman, Texas 75090; 300 W. Renner Road, Richardson, Texas 75080; and 2501 S. State Highway 121 Bus., Lewisville, Texas 75067. On information and belief, TI may be served in Texas via its registered agent, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

3. Prior to the filing of the Complaint, Redwood sent a letter received by TI on November 4, 2021, where Redwood attempted to engage TI in licensing discussions related to the Asserted Patents for reasonable and non-discriminatory terms for a license to be taken in the absence of litigation. TI ignored Redwood's request to engage in licensing discussions. Indeed, TI has known about each of the Asserted Patents since at least November 4, 2021, when TI received notice of its infringement of the Asserted Patents via the letter sent by Redwood.

4. Prior to the filing of the Complaint, Redwood sent another letter received by TI on May 23, 2022, where Redwood again attempted to engage TI in licensing discussions related to the Asserted Patents for reasonable and non-discriminatory terms for a license to be taken in the absence of litigation. TI again ignored Redwood's request to engage in licensing discussions. Indeed, TI has known about each of the Asserted Patents since at least May 23, 2022, when TI received the second notice of its infringement of the Asserted Patents via the letter sent by Redwood.

5. Furthermore, as a member of the relevant standards-setting bodies, on information and belief, TI is on notice of standard essential patents issued to other members of the standards bodies.

6. TI's past and continuing making, using, selling, offering for sale, and/or importing, and/or inducing its subsidiaries, affiliates, retail partners, and customers in the making, using, selling, offering for sale, and/or importing the accused Wi-Fi compliant devices throughout the United States i) willfully infringe each of the Asserted Patents and ii) impermissibly take the significant benefits of Redwood's patented technologies without fair compensation to Redwood.

7. TI is engaged in making, using, selling, offering for sale, and/or importing, and/or induces its subsidiaries, affiliates, retail partners, and customers in the making, using, selling,

offering for sale, and/or importing throughout the United States, including within this District, products, such as access points, accused of infringement.

JURISDICTION AND VENUE

8. This action arises under the patent laws of the United States, namely 35 U.S.C. §§ 271, 281, and 284-285, among others.

9. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

10. This Court has personal jurisdiction over TI in accordance with due process and/or the Texas Long Arm Statute because, among other things, TI does business in this State by, among other things, maintaining offices in this District, including maintaining its offices located at 6412 U.S. Highway 75, Sherman, Texas 75090; 300 W. Renner Road, Richardson, Texas 75080; and 2501 S. State Highway 121 Bus., Lewisville, Texas 75067.

11. Further, this Court has personal jurisdiction over TI because it has engaged, and continues to engage, in continuous, systematic, and substantial activities within this State, including the substantial marketing, making, using, and sale of products and services within this State and this District. Indeed, this Court has personal jurisdiction over TI because it has committed acts giving rise to Redwood's claims for patent infringement within and directed to this District, has derived substantial revenue from its goods and services provided to individuals in this State and this District, and maintains regular and established places of business in this District, including its places of business at 6412 U.S. Highway 75, Sherman, Texas 75090; 300 W. Renner Road, Richardson, Texas 75080; and 2501 S. State Highway 121 Bus., Lewisville, Texas 75067.

12. Relative to patent infringement, TI has committed and continues to commit acts in violation of 35 U.S.C. § 271, and has made, used, marketed, distributed, offered for sale, imported,

and/or sold infringing products in this State, including in this District, and otherwise engaged in infringing conduct within and directed at, or from, this District. Such products have been and continue to be offered for sale, distributed to, sold, and used in this District, and the infringing conduct has caused, and continues to cause, injury to Redwood, including injury suffered within this District. These are purposeful acts and transactions in this State and this District such that TI reasonably should know and expect that it could be haled into this Court because of such activities.

13. In addition, TI has knowingly induced and continues to knowingly induce infringement within this District by advertising, marketing, offering for sale and/or selling devices pre-loaded with infringing functionality within this District, to consumers, customers, manufacturers, distributors, resellers, partners, and/or end users, and providing instructions, user manuals, advertising, and/or marketing materials which facilitate, direct or encourage the use of infringing functionality with knowledge thereof.

14. Venue is proper in this District under 28 U.S.C. §§ 1391 and 1400(b) because TI has regular and established places of business in this District and has committed acts of infringement in this District. TI's regular and established places of business in this District include, at least, its facilities in 6412 U.S. Highway 75, Sherman, Texas 75090; 300 W. Renner Road, Richardson, Texas 75080; and 2501 S. State Highway 121 Bus., Lewisville, Texas 75067.

15. With respect to the '485 patent, the Accused Products are devices that include, but are not limited, to Defendant's devices that are compliant with Wi-Fi Multimedia ("WMM") (e.g., WL1807MOD, WL1837MOD, WL1805MOD, and WL1835MOD) and other devices, as well as, their components, and processes related to the same. With respect to the '130 patent, the Accused Products are mesh devices that include, but are not limited, to Defendant's mesh devices that are compliant with IEEE 802.11 (e.g., WL1807MOD, WL1831, WL1801, WL1805MOD,

WL1831MOD, WL1835MOD, WL1801MOD), as well as, their components, and processes related to the same. With respect to the '102 patent and the '140 patent, the Accused Products are devices that include, but are not limited, to Defendant's devices that are compliant with IEEE 802.11n and/or IEEE 802.11ac and/or IEEE 802.11ax (*e.g.*, CC3130, CC3230S, CC3230SF, CC3235MODAS, CC3235MODASF, CC3135MOD, CC3235MODS, CC3235MODSF, CC3135, CC3235S, CC3235SF, CC3220MODA, CC3120MOD, CC3220MOD, CC3120, CC3220R, CC3220S, CC3220SF, WL1807MOD, WL1837MOD, CC3100MOD, CC3200MOD, CC3100, CC3200, WL1831, WL1801, WL1805MOD, WL1831MOD, WL1835MOD, WL1801MOD, CC3300, and CC3301) and other devices, as well as, their components, and processes related to the same.¹

COUNT I

(INFRINGEMENT OF U.S. PATENT NO. 7,460,485)

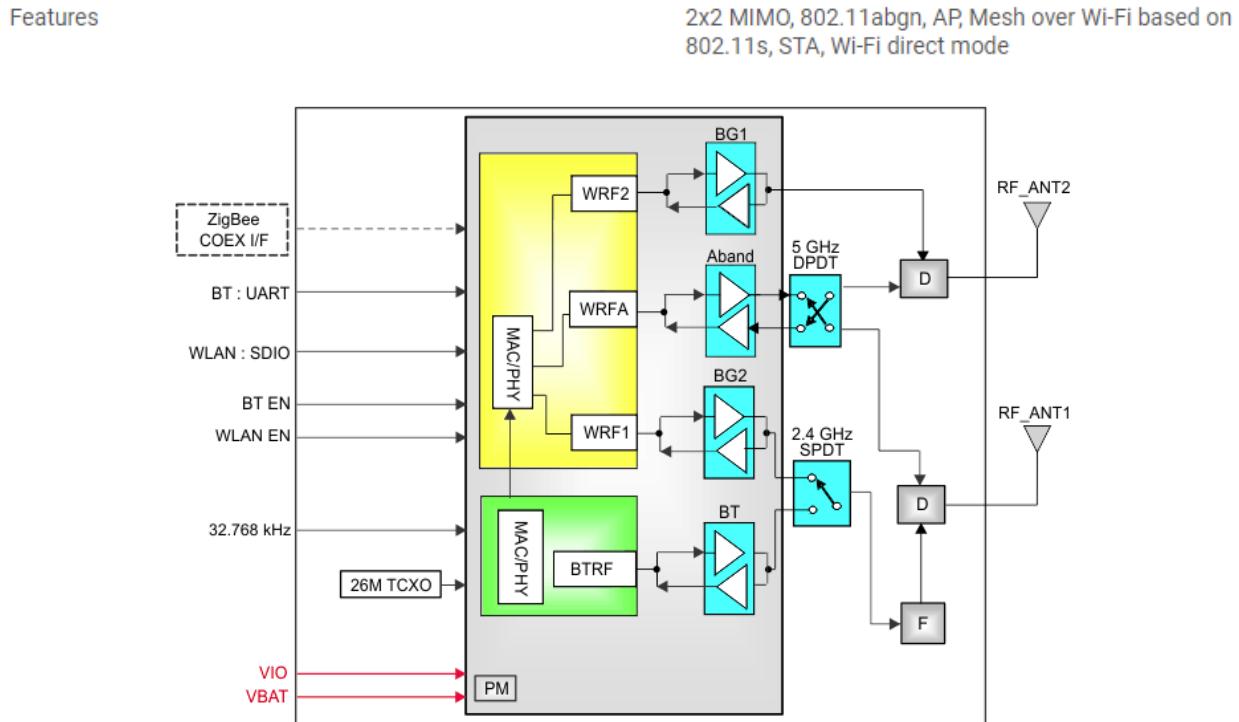
16. Plaintiff incorporates paragraphs 1 through 15 herein by reference.
17. Redwood is the assignee of the '485 patent, entitled "Methods for Performing Medium Dedication in Order to Ensure the Quality of Service for Delivering Real-Time Data Across Wireless Network," with ownership of all substantial rights in the '485 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.
18. The '485 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The '485 patent issued from U.S. Patent Application No. 10/654,901.

¹ Each of the relevant standards cited herein, and related to the Asserted Patents, are specifically incorporated into this Complaint.

19. TI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '485 patent in this judicial district and elsewhere in Texas and the United States.

20. TI directly infringes the '485 patent via 35 U.S.C. § 271(a) by using and/or testing the Accused Products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '485 patent.

21. TI infringes claim 1 of the '485 patent via the Accused Products, including the WL1807MOD WiLink 8 industrial dual band combo, 2x2 MIMO Wi-Fi Module ("WL1807MOD"). The Accused Products, including the WL1807MOD, are compliant with the Wi-Fi Alliance WMM requirements. *See, e.g.*, the Wi-Link 8 WLAN Features User's Guide, p. 13 at <https://www.ti.com/lit/ug/swru423a/swru423a.pdf?ts=1679918238708> ("WiLink8.0 devices are fully compliant with Wi-Fi Alliance WMM requirements.");



The Accused Products, including the WL1807MOD, perform a method for guaranteeing a quality of service (QoS) in delivering real-time data across a transmission medium. *See, e.g.*, Section 4.3.10 of Part 11: Wireless LAN Medium Access Control (MAC) and Physical (PHY) Specifications of IEEE Std 802.11™ -2016 (“IEEE 802.11 2016”) and Section 1.0 of the Wi-Fi Alliance Wi-Fi Multimedia Technical Specification, Version 1.2.0 (“WMM Specification V1.2.0”).

22. The Accused Products, including the WL1807MOD, each specify a traffic requirement for a traffic stream in accordance with a generic first specification. For example, the Accused Products utilize the traffic specification (“TSPEC”) element, which is a traffic requirement for a traffic stream based on QoS parameters for a particular Wi-Fi station (“STA”). *See, e.g.*, Section 9.4.2.30 of IEEE 802.11 2016 and Figure 14 of the WMM Specification V1.2.0.

23. The Accused Products, including the WL1807MOD, each transform the specified traffic requirement in accordance with a generic second specification based on the specified traffic requirement, an overhead requirement for the traffic stream and a condition of the transmission medium. For example, the Accused Products receive the TSPEC from an STA, and the Accused Products transform the TSPEC into medium time. *See, e.g.*, Section 3.5.2 of the WMM Specification V1.2.0. Medium Time is a traffic stream requirement utilized by the Accused Products which takes into consideration elements from the TSPEC, overhead requirements, and expected error performance on the medium. *See, e.g.*, Section K.4.1 of IEEE 802.11 2016 and A.3 of the WMM Specification V1.2.0.

24. The Accused Products, including the WL1807MOD, each adjust the generic second specification based on feedback obtained from monitoring the condition of the transmission

medium. For example, the Accused Products adjust the medium time with the receipt of each new TSPEC. *See, e.g.*, Sections 3.5.1 and 3.5.3 of the WMM Specification V1.2.0.

25. The Accused Products, including the WL1807MOD, each aggregate a plurality of specifications for a plurality of traffic streams into a single specification to reduce resources required to maintain and process the plurality of specifications and overhead incurred in medium dedication. For example, the Accused Products aggregate the mean data rate and burst size for a plurality of traffic streams to generate a single token bucket specification, which allows the Accused Products to manage the STA's admitted flows more effectively. *See, e.g.*, Section 3.5.1 of the WMM Specification V1.2.0.

26. The Accused Products, including the WL1807MOD, each perform medium dedication in accordance with the medium dedication schedule to coordinate transmission of the plurality of traffic streams. For example, the Accused Products perform the medium dedication according to the schedule to coordinate transmission between a plurality of STAs with admitted traffic streams. *See, e.g.*, Section 3.5.2 of the WMM Specification V1.2.0.

27. The specific ways in which the Accused Products, including the WL1807MOD, are configured to support the aforementioned features of WMM are further detailed in confidential documents and/or source code that evidence infringement by the Accused Products, including the WL1807MOD, as to Claim 1 of the '485 patent.

28. Furthermore, the Accused Products, including the WL1807MOD, are configured or implemented in an infringing manner with the features and functionality recited in at least Claim 1 of the '485 patent.

29. The technology discussion above and the exemplary Accused Products provide context for Plaintiff's infringement allegations.

30. The claims of the '485 Patent are patent eligible under 35 U.S.C. § 101. The '485 Patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. Instead, it offers, for example, a technologically complex invention that delivers “time sensitive data, such as real-time Audio-Visual data for interactive applications, communicative applications and gaming, across an erroneous transmission medium.” '485 Patent, 1:10-13. The '485 explains that “in order to meet the Quality of Service, data traffic need to be coordinated and scheduling of bandwidth dedication need to be performed.” '485 Patent, 1:13-15. The '485 Patent explains that its invention solves the problems identified by providing “a systematic way to perform medium dedication, by transforming traffic requirements into a form of specification that can incorporate the medium condition, by aggregating the specification to reduce overhead incurred, by merging individual medium dedication schedules for each stream into a unified medium dedication schedule, by performing medium dedication, by performing adaptation in order to tune the specification to be more reliable, and by performing monitoring and reporting of medium condition.” '485 Patent, 1:29-38. That solution is reflected for example in independent claim 1 of the '485 Patent.

31. At a minimum, TI has known of the '485 patent at least as early as the filing date of the Complaint. In addition, TI has known about the '485 patent since at least November 4, 2021, when TI and/or its agents received notice of its infringement via a letter. Furthermore, TI has known about the '485 patent since at least May 23, 2022, when TI and/or its agents received notice of its infringement via another letter.

32. On information and belief, since at least the above-mentioned date when TI was on notice of its infringement, TI has actively induced, under U.S.C. § 271(b), its distributors, customers, testing outfits, subsidiaries, importers, and/or consumers that use and/or test the

Accused Products comprising all of the limitations of one or more claims of the '485 patent to directly infringe one or more claims of the '485 patent by using and/or testing the Accused Products. Since at least the notice provided on the above-mentioned date, TI does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '485 patent. TI intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, *inter alia*, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States.

33. On information and belief, despite having knowledge of the '485 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '485 patent, TI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. TI's infringing activities relative to the '485 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

34. Redwood has been damaged as a result of TI's infringing conduct described in this Count. TI is, thus, liable to Redwood in an amount that adequately compensates Redwood for TI's

infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT II

(INFRINGEMENT OF U.S. PATENT NO. 7,664,130)

35. Plaintiff incorporates paragraphs 1 through 34 herein by reference.

36. Redwood is the assignee of the '130 patent, entitled "Wireless Communication System, Wireless Communication Apparatus, Wireless Communication Method, and Computer Program," with ownership of all substantial rights in the '130 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

37. The '130 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The '130 patent issued from U.S. Patent Application No. 11/066,482.

38. TI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '130 patent in this judicial district and elsewhere in Texas and the United States.

39. TI directly infringes the '130 patent via 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the Accused Products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '130 patent.

40. For example, TI infringes claim 10 of the '130 patent via the Accused Products, including the WL1807MOD. The Accused Products, including the WL1807MOD, comprise a wireless communication station (*e.g.*, a wireless mesh station or a mesh STA). *See, e.g.*, Fig. 19-2 of IEEE 802.11 2016; <https://www.ti.com/product/WL1807MOD> ("Mesh over Wi-Fi based on 802.11s"); Application Report of WiLink 8 WLAN Software – 802.11s Mesh, p. 2 at

https://www.ti.com/lit/ml/swaa166/swaa166.pdf?ts=1679937258490&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FWL1807MOD (“A Mesh Station (mesh STA), sometime referred to as Mesh Point (MP), uses beacons with special mesh attributes to advertise itself, to discover neighboring nodes and to keep track of them. Note that neighbor discovery is only limited to nodes that are in range of an MP.”)

41. The Accused Products, including the WL1807MOD, each comprise a transmitter configured to transmit beacons with information associated with a network being described therein to other communication stations to construct a network. For example, the Accused Products, including the WL1807MOD, comprise a transmitter configured to transmit a beacon containing a Mesh Configuration element advertising the mesh services of a mesh network. *See, e.g.*, Sections 9.3.3.3, 9.4.2.98.1 and 14.13.3.31 of IEEE 802.11 2016; Application Report of WiLink 8 WLAN Software – 802.11s Mesh, p. 2 at https://www.ti.com/lit/ml/swaa166/swaa166.pdf?ts=1679937258490&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FWL1807MOD (“A Mesh Station (mesh STA), sometime referred to as Mesh Point (MP), uses beacons with special mesh attributes to advertise itself, to discover neighboring nodes and to keep track of them. Note that neighbor discovery is only limited to nodes that are in range of an MP.”)

42. The Accused Products, including the WL1807MOD, each comprise a receiver configured to receive timing information concerning priority transmission of a neighborhood communication station from said other communication stations. For example, the Accused Products comprise a receiver configured to receive a beacon that contains the Beacon Timing element, which comprises Beacon Timing Information fields that prioritize transmissions from neighborhood communications to avoid Beacon frame collisions. *See, e.g.*, Sections 9.4.2.105,

14.13.4.2.6, and 14.13.4.3 and Figures 9-462 and 9-464 of IEEE 802.11 2016; Application Report of WiLink 8 WLAN Software – 802.11s Mesh, p. 2 at https://www.ti.com/lit/ml/swaa166/swaa166.pdf?ts=1679937258490&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FWL1807MOD (“A Mesh Station (mesh STA), sometime referred to as Mesh Point (MP), uses beacons with special mesh attributes to advertise itself, to discover neighboring nodes and to keep track of them. Note that neighbor discovery is only limited to nodes that are in range of an MP.”); *id.*, p. 4 (“All mesh points are connected to each other and can pass information from one to any other.”).

43. The Accused Products, including the WL1807MOD, each comprise a transmitter further configured to transmit a message to the neighborhood communication station, the message requesting a report of timing information concerning priority transmission of the neighborhood communication station. For example, the Accused Products, including the WL1807MOD, each comprise a transmitter further configured to transmit a Probe Request frame to request Beacon Timing Information concerning priority transmission of the neighborhood communication station. *See, e.g.*, Section 14.13.4.2.6 and Figure 9-464 of IEEE 802.11 2016; Application Report of WiLink 8 WLAN Software – 802.11s Mesh, p. 2 at https://www.ti.com/lit/ml/swaa166/swaa166.pdf?ts=1679937258490&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FWL1807MOD (“A Mesh Station (mesh STA), sometime referred to as Mesh Point (MP), uses beacons with special mesh attributes to advertise itself, to discover neighboring nodes and to keep track of them. Note that neighbor discovery is only limited to nodes that are in range of an MP.”); *id.*, p. 4 (“All mesh points are connected to each other and can pass information from one to any other.”).

44. The specific ways in which the Accused Products, including the WL1807MOD, are configured to support the aforementioned features of IEEE 802.11 2016 are further detailed in confidential documents and/or source code that evidence infringement by the Accused Products as to at least Claim 10 of the '130 patent.

45. Furthermore, the Accused Products, including the WL1807MOD, are configured or implemented in an infringing manner with the features and functionality recited in at least Claim 10 of the '130 patent.

46. The technology discussion above and the exemplary Accused Products provide context for Plaintiff's infringement allegations.

47. The claims of the '130 Patent are patent eligible under 35 U.S.C. § 101. The '130 Patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. Instead, it offers, for example, a technologically complex invention that "relates to a wireless communication system, a wireless communication apparatus, a wireless communication method and a computer program, all enabling each communication station to evade mutual interference while performing communication securing a band by providing a prioritized utilization region." '130 Patent, 1:35-41. The '130 Patent provides a technical solution to advance the goal above, for example, by describing that "each communication station can gather the transmission-reception dangerous zone by receiving the prioritized transmission frame from a neighboring station, and the system may be adapted so that each communication station informs the acquired information pertaining to the transmission-reception dangerous zone to the neighboring station. In such a case, when each communication station tries to perform a frame transmission, the communication station can prevent collisions previously by performing the frame transmission in the way of avoiding the

transmission-reception dangerous zones recorded in the information signal received from the transmission destination.” ’130 Patent, 14:30-41. That solution is reflected in independent claim 10 of the ’130 Patent, which includes a limitation that recites “requesting a report of timing information concerning priority transmission of the neighborhood communication station.”

48. At a minimum, TI has known of the ’130 patent at least as early as the filing date of the Complaint. In addition, TI has known about the ’130 patent since at least November 4, 2021, when TI and/or its agents received notice of the ’130 patent via a letter. Furthermore, TI has known about the ’130 patent since at least May 23, 2022, when TI and/or its agents received notice of its infringement via another letter.

49. On information and belief, since at least the above-mentioned date when TI was on notice of its infringement, TI has actively induced, under U.S.C. § 271(b), its distributors, customers, subsidiaries, importers, and/or consumers that import, use, purchase, offer to sell, or sell the Accused Products comprising all of the limitations of one or more claims of the ’130 patent to directly infringe one or more claims of the ’130 patent by using, offering for sale, selling, and/or importing the Accused Products. Since at least the notice provided on the above-mentioned date, TI does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’130 patent. TI intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in

the Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States.

50. On information and belief, despite having knowledge of the '130 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '130 patent, TI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. TI's infringing activities relative to the '130 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

51. Redwood has been damaged as a result of TI's infringing conduct described in this Count. TI is, thus, liable to Redwood in an amount that adequately compensates Redwood for TI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT III

(INFRINGEMENT OF U.S. PATENT NO. 7,917,102)

52. Plaintiff incorporates paragraphs 1 through 51 herein by reference.

53. Redwood is the assignee of the '102 patent, entitled "Radio Transmitting Apparatus and Radio Transmission Method," with ownership of all substantial rights in the '102 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

54. The '102 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The '102 patent issued from U.S. Patent Application No. 11/937,422.

55. TI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '102 patent in this judicial district and elsewhere in Texas and the United States.

56. TI directly infringes the '102 patent via 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the Accused Products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '102 patent.

57. For example, TI infringes claim 3 of the '102 patent via the Accused Products, including the WL1807MOD. The Accused Products, including the WL1807MOD, each are compliant with IEEE 802.11n and/or IEEE 802.11ac and/or IEEE 802.11ax, and each comprise a radio transmitting apparatus that transmits a modulated signal. *See, e.g.,* <https://www.ti.com/product/WL1807MOD>.

58. The Accused Products, including the WL1807MOD, each comprise circuitry and/or components (hardware and/or software) that forms a transmission frame which includes a frequency offset estimation signal for estimating frequency offset of the modulated signal at a receiving apparatus, a channel fluctuation estimation signal for estimating channel fluctuation of the modulated signal at the receiving apparatus and a gain control signal for performing gain control of the modulated signal at the receiving apparatus. The Accused Products, including the WL1807MOD, must be configured to form the claimed “transmission frame” for a HT-mixed format PPDU frame, which is a mandatory feature of IEEE 802.11 2016. *See, e.g.,* Figure 19-1 of IEEE 802.11 2016; https://www.albany.edu/faculty/dsaha/teach/2019Spring_CEN574/slides/08_WLAN.pdf at slides 67-68 (the HT-mixed format PPDU is mandatory). For example, the Accused Products, including

the WL1807MOD, each form a HT-mixed format PPDU frame, which comprises an L-LTF subframe, which is a frequency offset estimation signal. *See, e.g.*, Figures 17-4 and 19-1 of IEEE 802.11 2016. The HT-mixed format PPDU frame also comprises an HT-LTF subframe, which is a channel fluctuation estimation signal. *See, e.g.*, Figure 19-1 and Section 19.3.9.4.6 of IEEE 802.11 2016. The HT-mixed format PPDU frame also comprises an L-STF subframe, which is a gain control signal. *See, e.g.*, Figure 19-1 and Section 19.3.9.3.3 of IEEE 802.11 2016.

59. The Accused Products, including the WL1807MOD, each comprise circuitry and/or components (hardware and/or software) configured to transmit the transmission frame. For example, the Accused Products, including the WL1807MOD, must be configured to transmit a transmission frame for a HT-mixed format PPDU, which is a mandatory feature of IEEE 802.11 2016. *See, e.g.*, Figure 19-1 of IEEE 802.11 2016; https://www.albany.edu/faculty/dsaha/teach/2019Spring_CEN574/slides/08_WLAN.pdf at slides 67-68 (the HT-mixed format PPDU is mandatory).

60. The transmission frame includes a first gain control signal and a second gain control signal. For example, the HT-mixed format PPDU comprises a first gain control signal in the L-STF subframe and a second gain control signal in the HT-STF subframe. *See, e.g.*, Figure 19-1 and Sections 19.3.9.3.3 and 19.3.9.4.5 of IEEE 802.11 2016. The first gain control signal is arranged prior to the frequency offset estimation signal. For example, the L-STF subframe is arranged prior to the L-LTF subframe. *See, e.g.*, Figure 19-1 of IEEE 802.11 2016. The second gain control is arranged subsequent to the frequency offset estimation signal and prior to the channel fluctuation estimation signal. For example, the HT-STF subframe is arranged subsequent to the L-LTF subframe and prior to the HT-LTF subframe. *See, e.g.*, Figure 19-1 of IEEE 802.11 2016.

61. The specific ways in which the Accused Products, including the WL1807MOD, are configured to support the aforementioned features of IEEE 802.11n and/or 802.11ac and/or 802.11ax are further detailed in confidential documents and/or source code that evidence infringement by the Accused Products as to Claim 3 of the '102 patent.

62. Furthermore, the Accused Products, including the WL1807MOD, are configured or implemented in an infringing manner with the features and functionality recited in at least Claim 3 of the '102 patent.

63. The technology discussion above and the exemplary Accused Products provide context for Plaintiff's infringement allegations.

64. The claims of the '102 Patent are patent eligible under 35 U.S.C. § 101. The '102 Patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. Instead, for example, it offers a technologically complex, particularized "radio transmitting apparatus and radio transmission method that enable[s] reception quality to be improved by reducing pilot symbol and data symbol quantization error in a system in which the number of simultaneously transmitted modulated signals is changed according to the propagation environment and so forth." '102 Patent, 2:12-18. The '102 Patent provides the technical solution above, for example, by "changing the transmit power of the modulated signal transmitted from each antenna according to the number of antennas that simultaneously transmit modulated signals (that is, the number of modulated signals)." '102 Patent, 2:19-22. That solution is reflected in the claims 1, 3, 5, and 10 of the '102 Patent, which include, for example, gain control limitations that can be used in the changing of the transmit power of the modulated signals. See, e.g., '102 Patent, 17:34-50.

65. At a minimum, TI has known of the '102 patent at least as early as the filing date of the Complaint. In addition, TI has known about the '102 patent since at least November 4, 2021, when TI and/or its agents received notice of its infringement via a letter. Furthermore, TI has known about the '102 patent since at least May 23, 2022, when TI and/or its agents received notice of its infringement via another letter.

66. On information and belief, since at least the above-mentioned date when TI was on notice of its infringement, TI has actively induced, under U.S.C. § 271(b), its distributors, customers, subsidiaries, importers, and/or consumers that import, use, purchase, offer to sell, or sell the Accused Products comprising all of the limitations of one or more claims of the '102 patent to directly infringe one or more claims of the '102 patent by using, offering for sale, selling, and/or importing the Accused Products. Since at least the notice provided on the above-mentioned date, TI does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '102 patent. TI intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States.

67. On information and belief, despite having knowledge of the '102 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '102 patent, TI

has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. TI's infringing activities relative to the '102 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

68. Redwood has been damaged as a result of TI's infringing conduct described in this Count. TI is, thus, liable to Redwood in an amount that adequately compensates Redwood for TI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT IV

(INFRINGEMENT OF U.S. PATENT NO. 7,983,140)

69. Plaintiff incorporates paragraphs 1 through 68 herein by reference.

70. Redwood is the assignee of the '140 patent, entitled "Transmitting Apparatus, Receiving Apparatus, and Communication System for Formatting Data," with ownership of all substantial rights in the '140 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

71. The '140 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The '140 patent issued from U.S. Patent Application No. 11/004,256.

72. TI has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims of the '140 patent in this judicial district and elsewhere in Texas and the United States.

73. TI directly infringes the '140 patent via 35 U.S.C. § 271(a) by making, using, offering for sale, selling, and/or importing the Accused Products, their components and processes, and/or products containing the same that incorporate the fundamental technologies covered by the '140 patent.

74. For example, TI infringes claim 1 of the '140 patent via the Accused Products, including the WL1807MOD. The Accused Products, including the WL1807MOD, comprise a transmitting apparatus, in an orthogonal frequency division multiplexing communication system. *See, e.g.,* <https://www.ti.com/product/WL1807MOD>.

75. The Accused Products, including the WL1807MOD, each comprise circuitry and/or components (hardware and/or software) for converting a transmission signal into a transmission time slot. For example, the Accused Products, including the WL1807MOD, convert PSDUs into PPDUs. *See, e.g.,* Sections 17.3.1 and 17.3.2.1 of IEEE 802.11 2016.

76. The Accused Products, including the WL1807MOD, each comprise circuitry and/or components (hardware and/or software) for generating a frame that includes a series of n (greater than 1) time slots and a frame guard period added to the series of n time slots, where each time slot includes an effective symbol period and guard period added to the effective symbol period, where the length of the series of n time slots is less than the length of the frame. For example, each of the Accused Products, including the WL1807MOD, generates a PPDU frame that comprises a series of time slots associated with the signal and data OFDM symbols. *See, e.g.,* Figures 17-1 and 17-4 of IEEE 802.11 2016. Each of the Accused Products, including the WL1807MOD, generates cyclic shifts that are added to the series of n time slots. *See, e.g.,* Sections 19.3.4 and 19.3.9.3.2 of IEEE 802.11 2016. Each time slot in the PPDU frame comprises an effective symbol period, and a guard period is added at the start of each effective symbol period.

See, e.g., Table 19-6 and Figure 17-4 of IEEE 802.11 2016. Further, the length of the series of n time slots is less than the total length of the PPDU frame. *See, e.g.*, Figure 17-4 of IEEE 802.11 2016.

77. The Accused Products, including the WL1807MOD, each comprise circuitry and/or components (hardware and/or software) for transmitting the generated frame as a radio signal. *See, e.g.*, Section 17.3.8.2 of IEEE 802.11 2016.

78. The specific ways in which the Accused Products, including the WL1807MOD, are configured to support the aforementioned features of IEEE 802.11n and/or 802.11ac and/or 802.11ax are further detailed in confidential documents and/or source code that evidence infringement by the Accused Products as to at least Claim 1 of the '140 patent.

79. Furthermore, the Accused Products, including the WL1807MOD, are configured or implemented in an infringing manner with the features and functionality recited in at least Claim 1 of the '140 patent.

80. The technology discussion above and the exemplary Accused Products provide context for Plaintiff's infringement allegations.

81. The claims of the '140 Patent are patent eligible under 35 U.S.C. § 101. The '140 Patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. Instead, it is a technologically complex, particularized method of signal conversion and transmission. The '140 Patent explains a problem that exists in cellular networks, namely that different cells transmitting in the same frequency will interfere with each other. *See, e.g.*, '140 Patent, 1:30-32. That interference can be solved by having the different cells use different frequencies, but that solution causes another problem, i.e., decreased spectrum efficiency. *See, e.g.*, '140 Patent, 1:30-44. Thus,

'140 Patent explains, "it is important to design a communication system such that the system has high resistance against interference thereby achieving an improvement in the spectrum efficiency".

'140 Patent, 1:45-47.

82. The '140 Patent provides a technical solution to that technical problem by implementing "an improvement in a format of data that is modulated and transmitted using, for example, an OFDM (Orthogonal Frequency Division Multiplexing) technique." '140 Patent, 1:14-17. The claims of the '140 Patent provide for a specific format of transmission for that purpose. For example, the "frame" in claim 1 includes a "a frame guard period added to the series of n time slots." As the '140 Patent explains, when "no frame guard is used, the interfering wave IFW interferes with two frames of the desired wave DSW. In contrast, in the communication system according to the present embodiment of the invention, a frame guard included in an OFDM signal prevents the interfering wave IFW from interfering with the second frame, as shown in FIGS. 15(A) and 15(B)." '140 Patent, 18:63-19:2. This helps achieve the goal of the of the '140 Patent of "suppression of a frame loss due to interference caused by use of the same channel." *Id.* at 3:32-33. Thus, the claimed transmission apparatus uses a transmission format designed to add efficiency to the transmission process in a particular manner. As such, the recited transmission apparatus is a concrete technical contribution and not simply the embodiment of an abstract idea.

83. At a minimum, TI has known of the '140 patent at least as early as the filing date of the Complaint. In addition, TI has known about the '140 patent since at least November 4, 2021, when TI and/or its agents received notice of its infringement via a letter. Furthermore, TI has known about the '140 patent since at least May 23, 2022, when TI and/or its agents received notice of its infringement via another letter.

84. On information and belief, since at least the above-mentioned date when TI was on notice of its infringement, TI has actively induced, under U.S.C. § 271(b), its distributors, customers, subsidiaries, importers, and/or consumers that import, use, purchase, offer to sell, or sell the Accused Products comprising all of the limitations of one or more claims of the '140 patent to directly infringe one or more claims of the '140 patent by using, offering for sale, selling, and/or importing the Accused Products. Since at least the notice provided on the above-mentioned date, TI does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '140 patent. TI intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States.

85. On information and belief, despite having knowledge of the '140 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '140 patent, TI has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. TI's infringing activities relative to the '140 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is

entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

86. Redwood has been damaged as a result of TI's infringing conduct described in this Count. TI is, thus, liable to Redwood in an amount that adequately compensates Redwood for TI's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

CONCLUSION

87. Plaintiff Redwood is entitled to recover from TI the damages sustained by Plaintiff as a result of TI's wrongful acts, and willful infringement, in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court.

88. Plaintiff has incurred and will incur attorneys' fees, costs, and expenses in the prosecution of this action. The circumstances of this dispute may give rise to an exceptional case within the meaning of 35 U.S.C. § 285, and Plaintiff is entitled to recover its reasonable and necessary attorneys' fees, costs, and expenses.

JURY DEMAND

89. Plaintiff hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

PRAYER FOR RELIEF

90. Plaintiff respectfully requests that the Court find in its favor and against TI, and that the Court grant Plaintiff the following relief:

1. A judgment that TI has infringed the Asserted Patents as alleged herein, directly and/or indirectly by way of inducing infringement of such patents;

2. A judgment for an accounting of all damages sustained by Plaintiff as a result of the acts of infringement by TI;
3. A judgment and order requiring TI to pay Plaintiff damages under 35 U.S.C. § 284, including up to treble damages as provided by 35 U.S.C. § 284, and any royalties determined to be appropriate;
4. A judgment and order requiring TI to pay Plaintiff pre-judgment and post-judgment interest on the damages awarded;
5. A judgment and order finding this to be an exceptional case and requiring TI to pay the costs of this action (including all disbursements) and attorneys' fees as provided by 35 U.S.C. § 285; and
6. Such other and further relief as the Court deems just and equitable.

Dated: March 29, 2023

Respectfully submitted,

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